



Value of Municipal Water Conservation

Michael Brent, Cascade Water Alliance

December 14, 2018

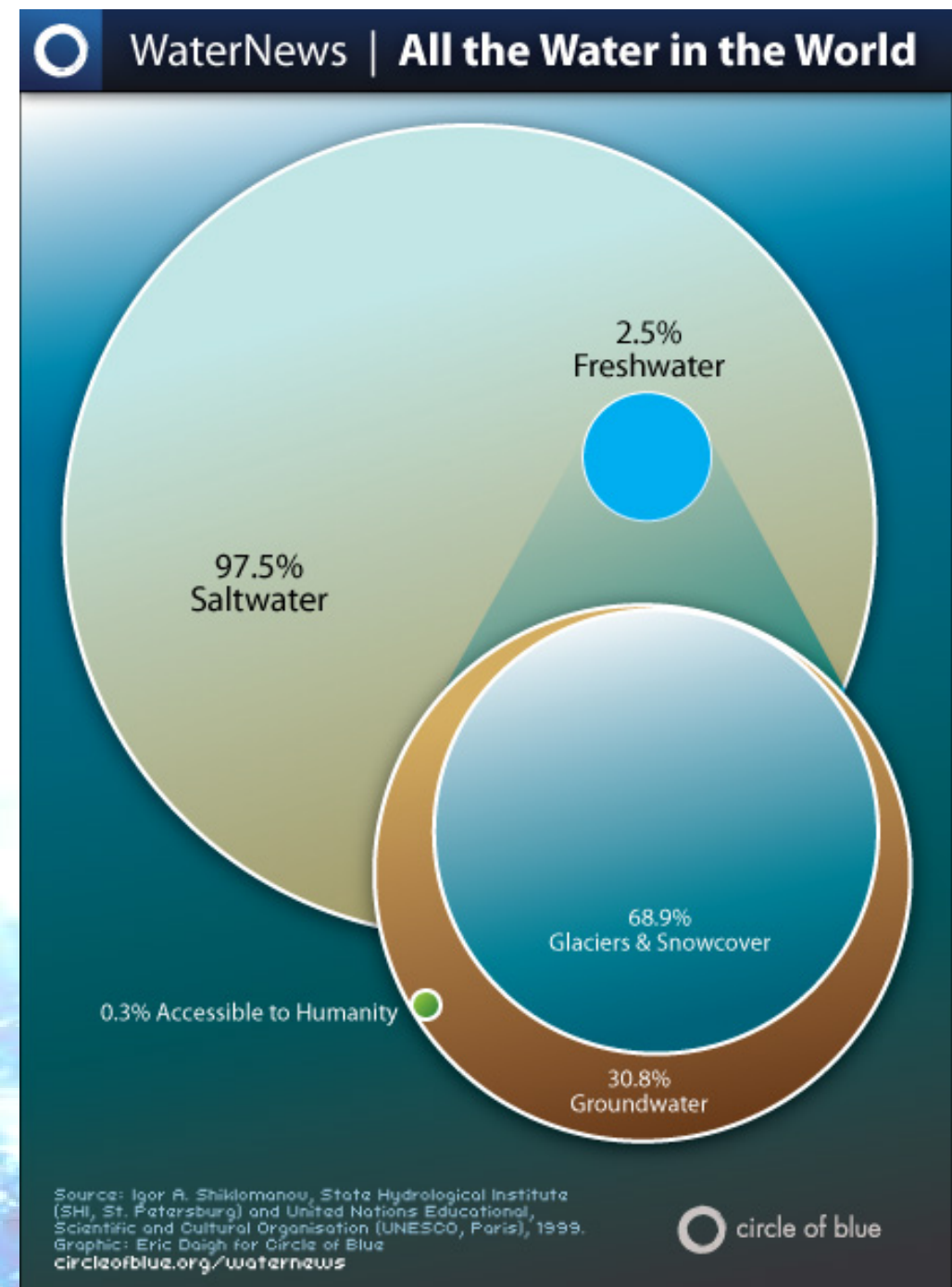
Cascade Water Alliance

- Municipal water provider formed in 1999 for seven cities and water districts in suburban King County
- Serve 400,000 residents and 20,000 businesses
- Supply water through purchases from Seattle Public Utilities and member groundwater supplies
- Own and operate Lake Tapps; White River Project
- Provide planning, contracting, and water conservation programs

Cascade Water Alliance

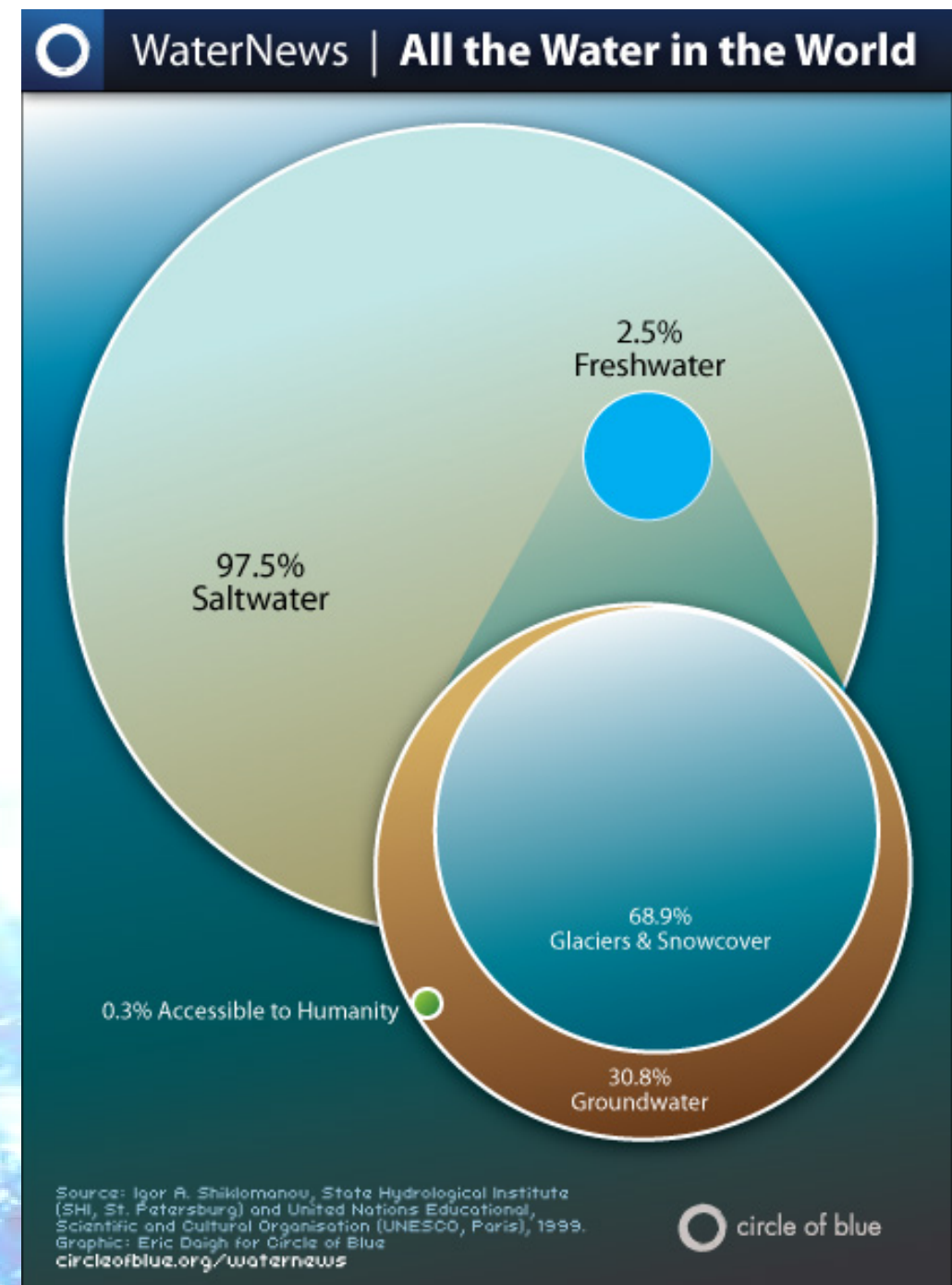
- Active water conservation program since 2004
- Measures addressing
 - Replacement of old showerheads | toilets | clothes washers
 - Landscape irrigation systems (sprinklers)
 - Education and outreach
 - Training
- Recognized by AWWA and US EPA
 - WaterSense Partner of the Year (2010 and 2016)

How much freshwater?

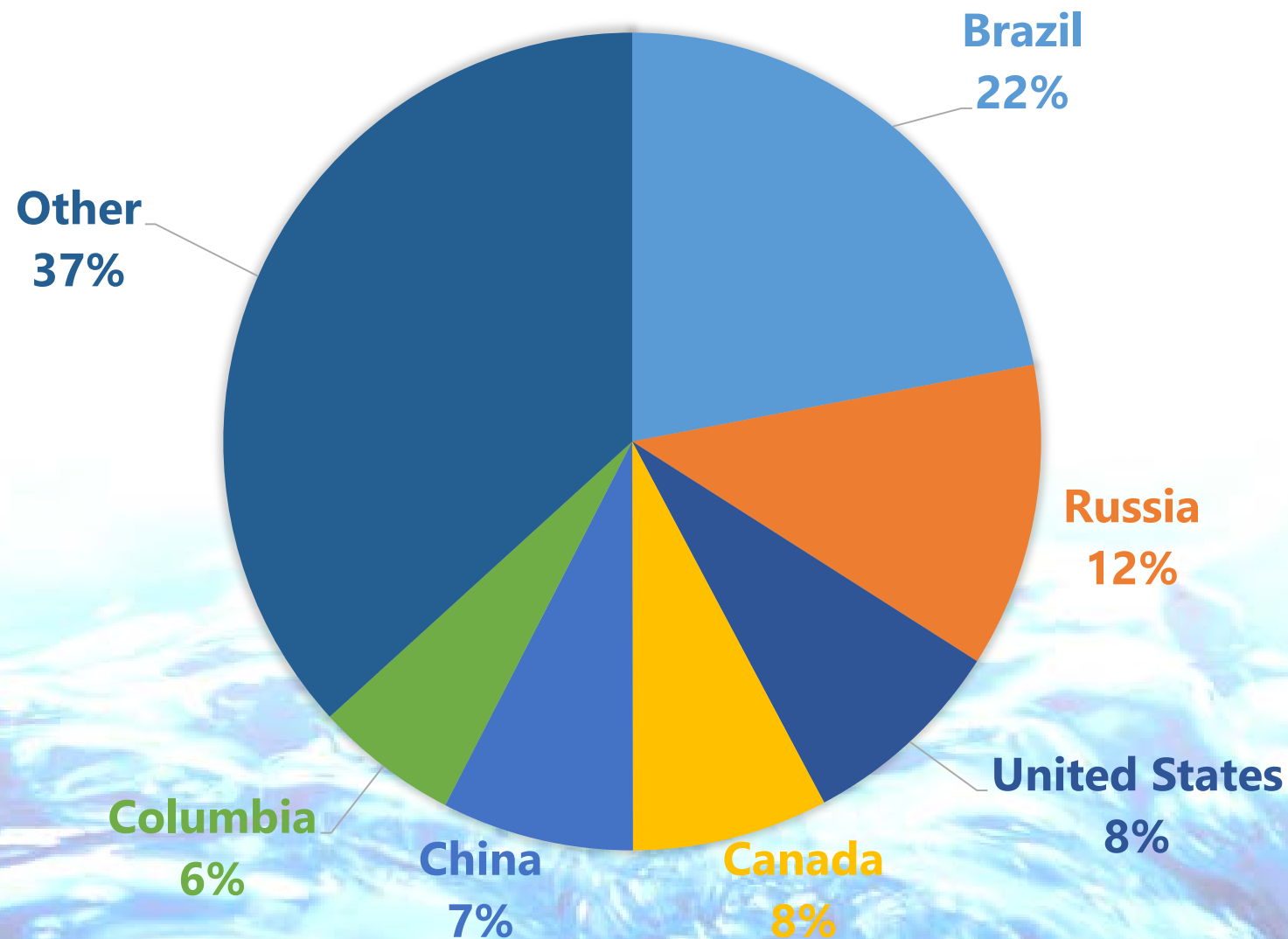


How much freshwater?

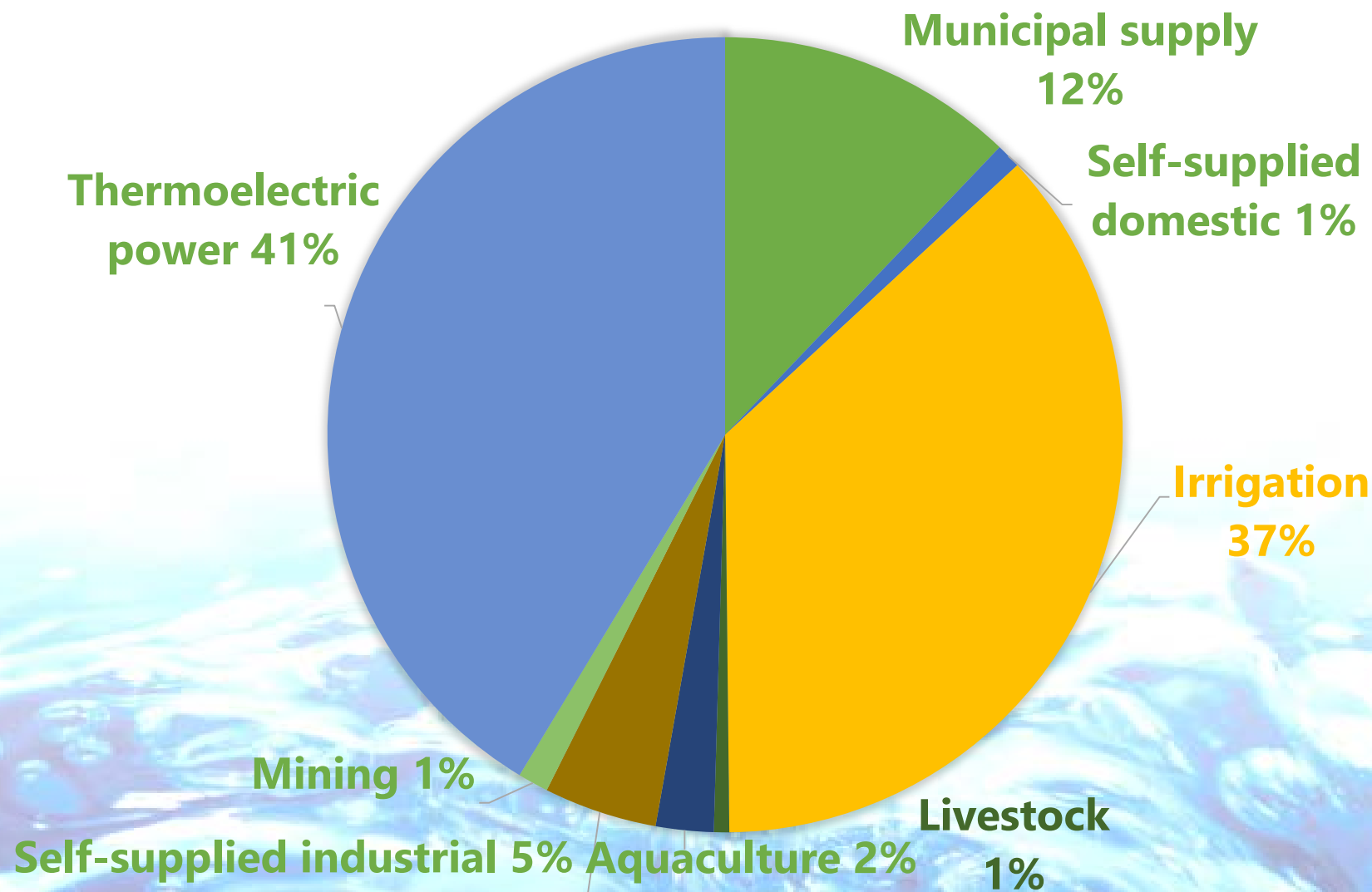
0.3% of earth's water for 7.6 billion people











Where is the freshwater?



How is freshwater used in the US?



Residential indoor water use

							
Toilet 24% 33.1 gphd	Shower 20% 28.1 gphd	Faucet 19% 26.3 gphd	Clothes washer 17% 22.7 gphd	Leak 12% 17.0 gphd	Other* 4% 5.3 gphd	Bath 3% 3.6 gphd	Dishwasher 1% 1.6 gphd

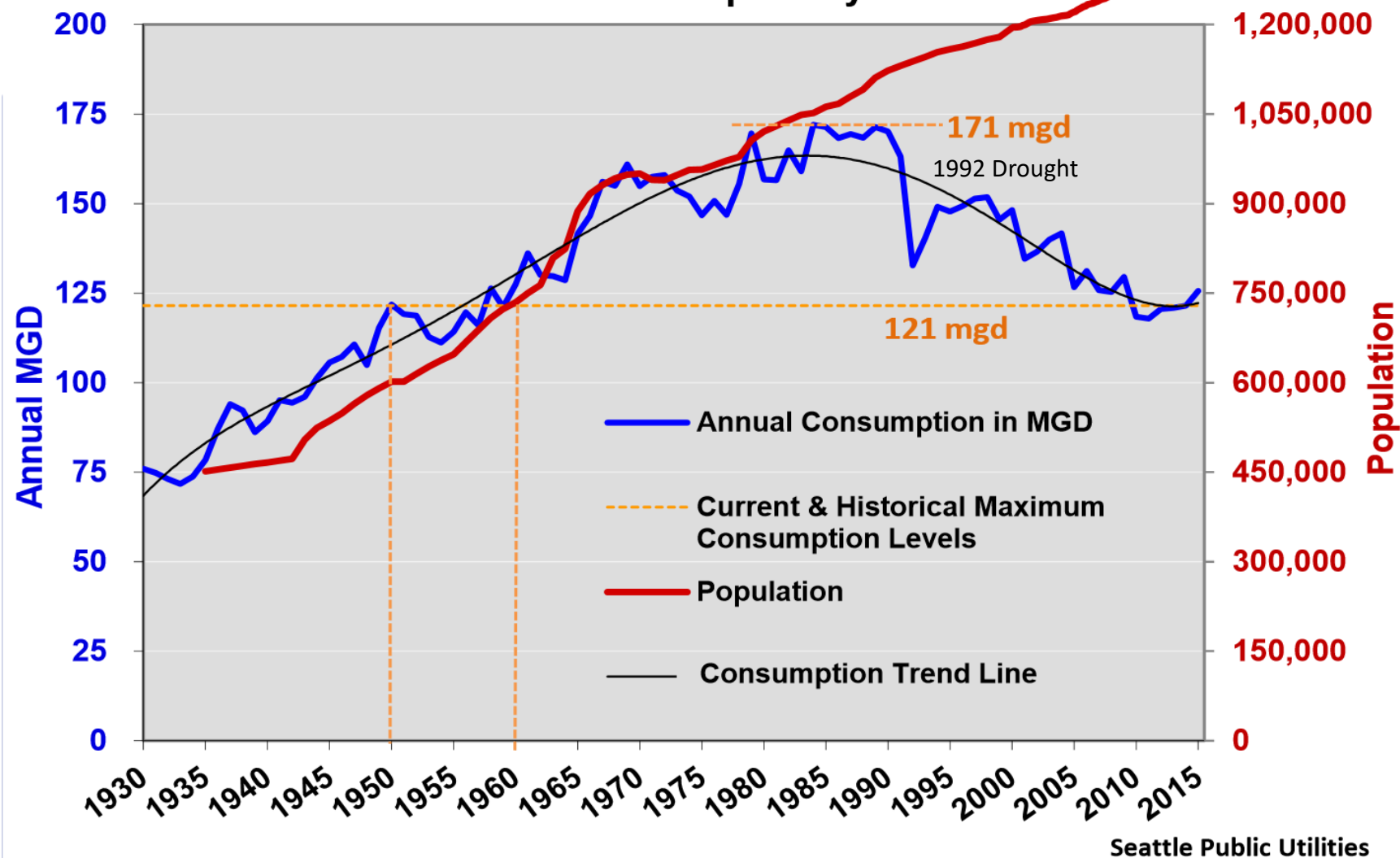
Pop Quiz!

In the greater Seattle area, is municipal water use

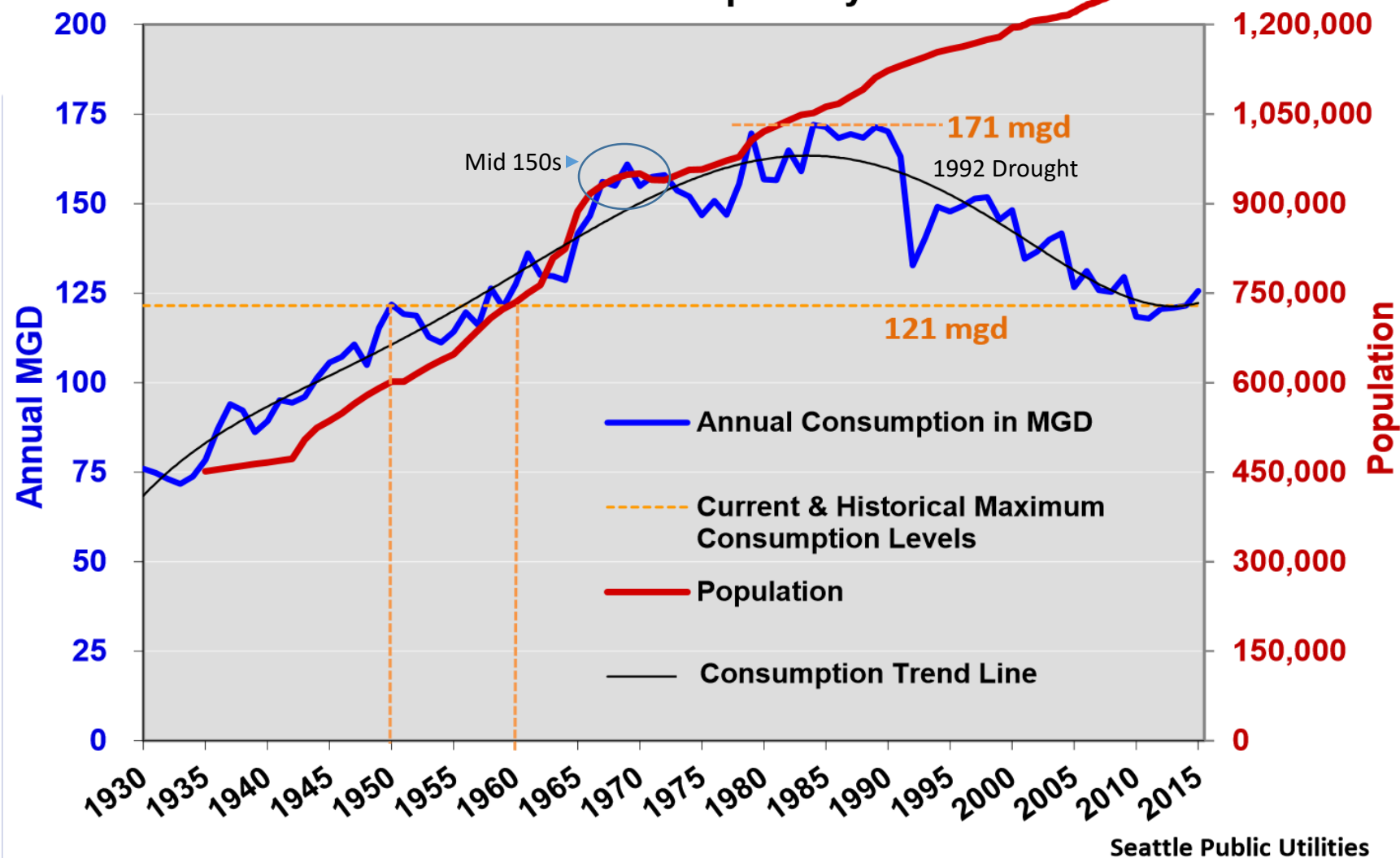
1. Greater than it was 50 years ago?
2. About the same as it was 50 years ago?
3. Less than it was 50 years ago?



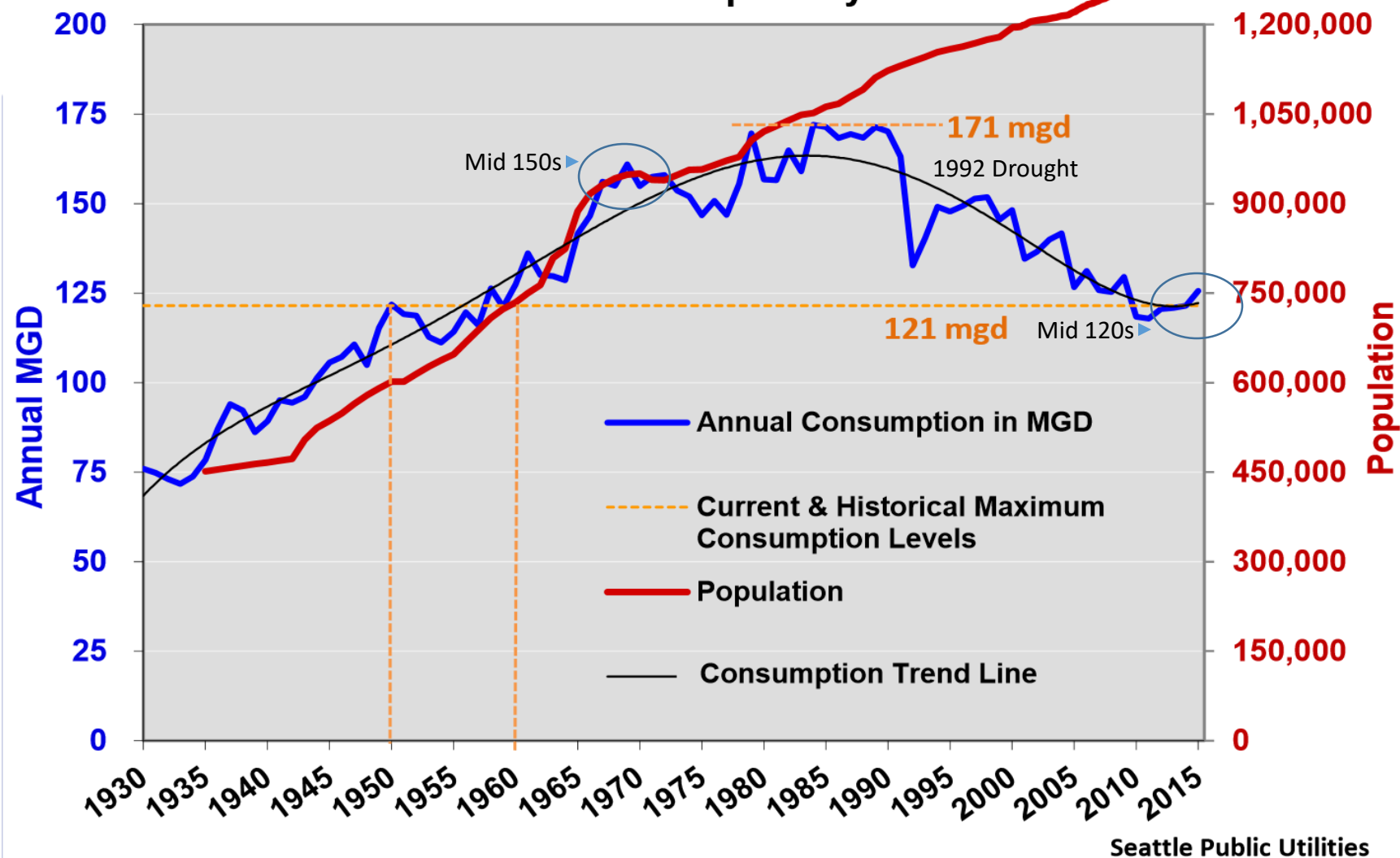
Total Seattle Regional Water System Annual Demand in Millions of Gallons per Day: 1930-2015



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Why is municipal water demand decreasing?



Water use efficiency rule

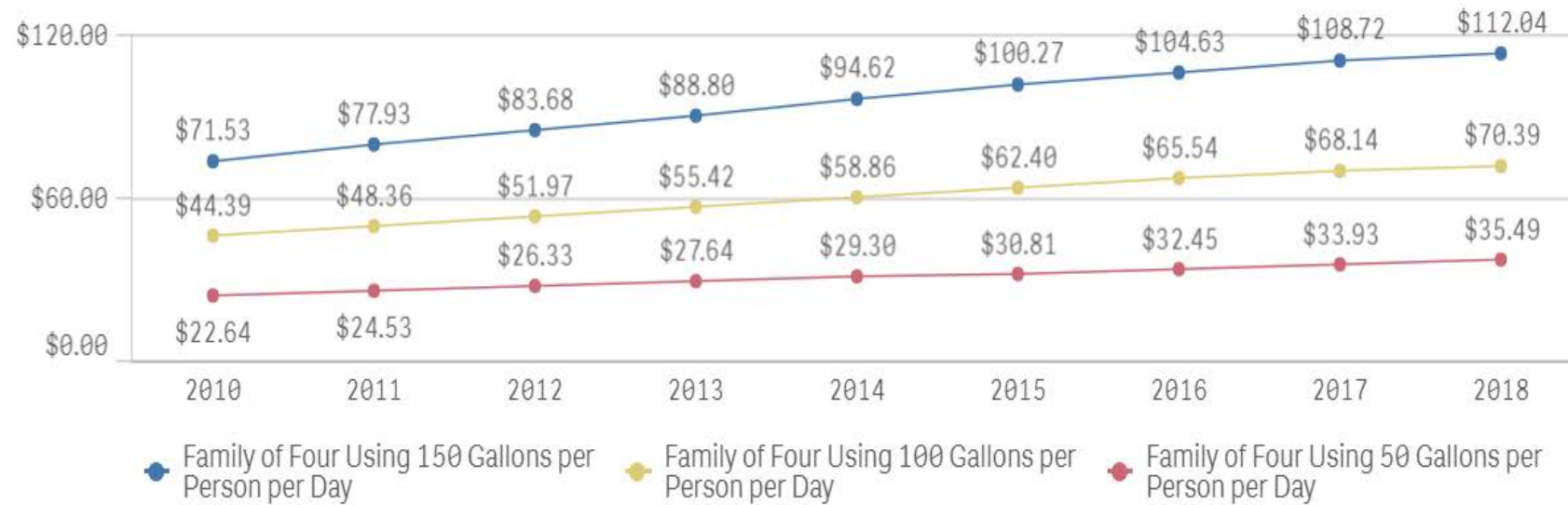
(2003 Municipal Water Law, RCW 90.03; WAC 246-290)

Requirements for water providers

- Establish water savings goal
- Develop a WUE planning program to support the established goals
- Report annually on progress towards achieving these goals
- Install meters on all customer connections by January 22, 2017
- Achieve a standard of no more than 10% water loss

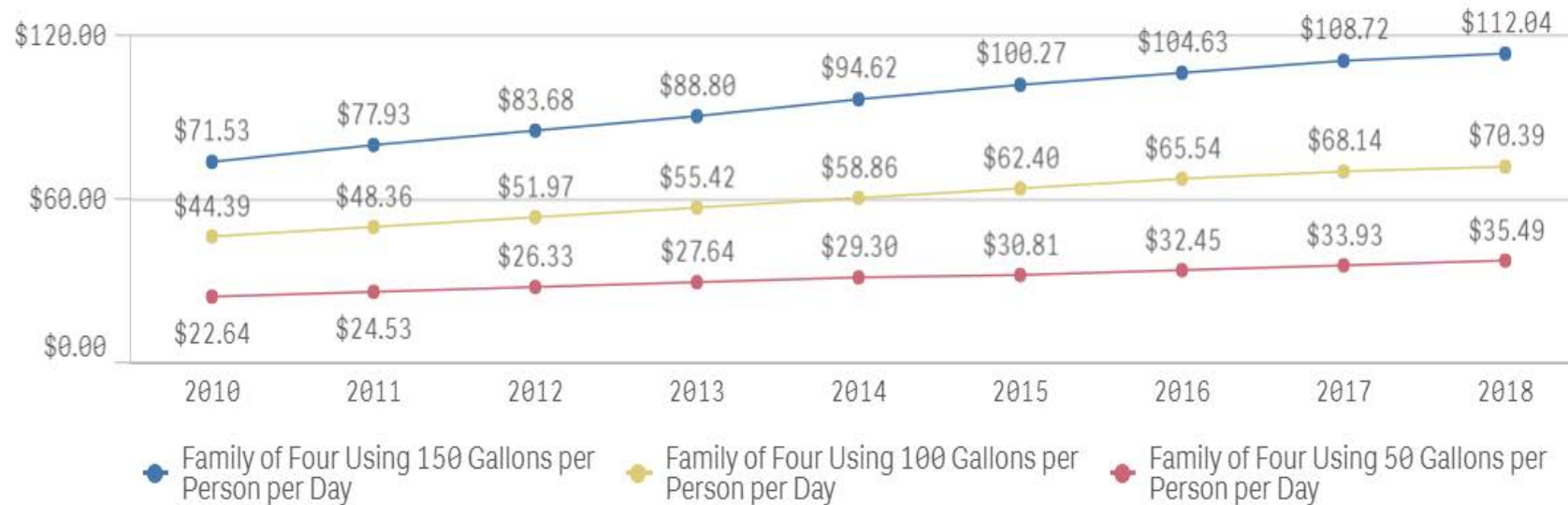
Rising cost of water

Average Monthly Cost of Water



Rising cost of water

Average Monthly Cost of Water



- Cost of water rising faster than the rate of inflation



2017
INFRASTRUCTURE
REPORT CARD

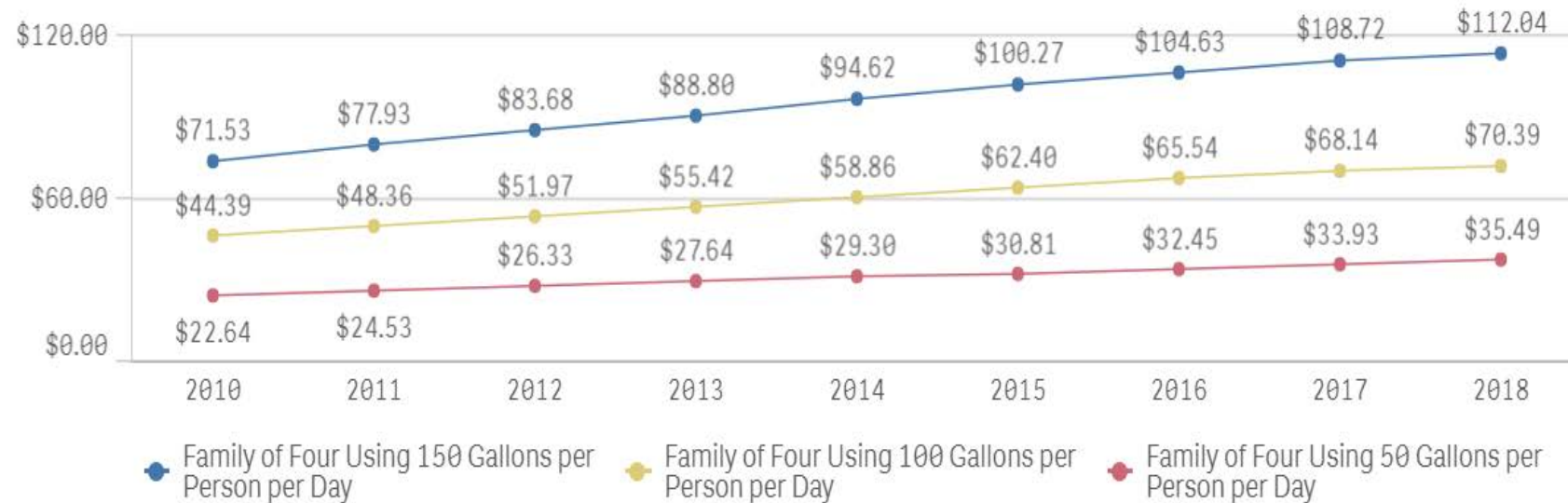


OVERVIEW

Drinking water is delivered via one million miles of pipes across the country. Many of those pipes were laid in the early to mid-20th century with a lifespan of 75 to 100 years. The quality of drinking water in the

Rising cost of water

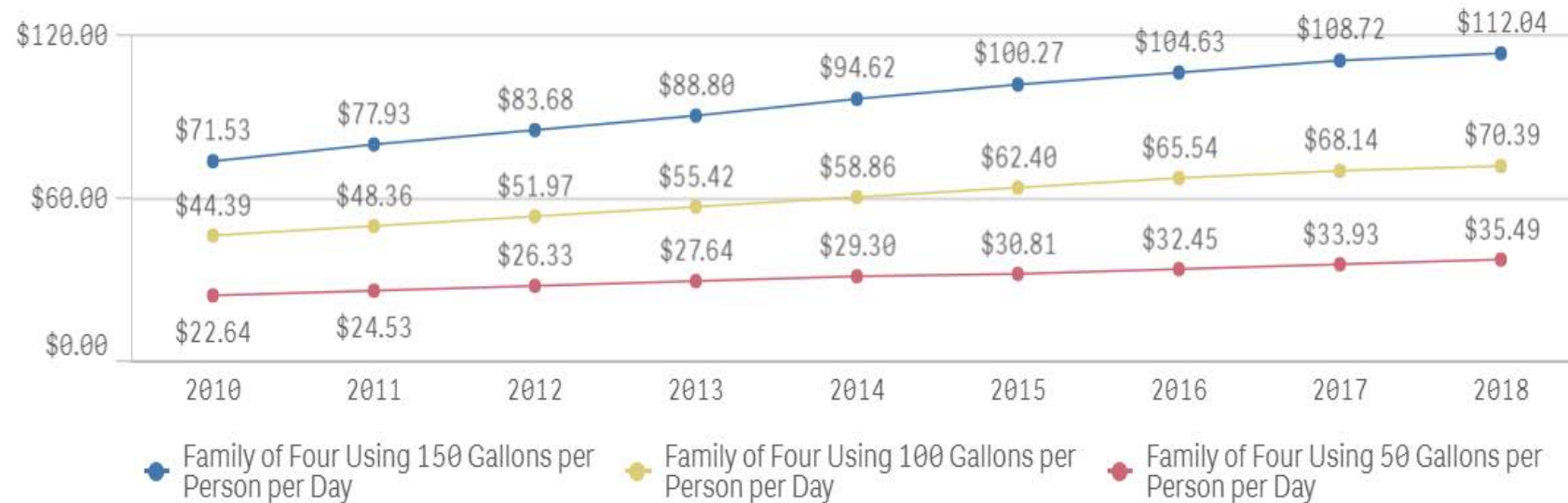
Average Monthly Cost of Water



- Cost of water rising faster than the rate of inflation
- Investment in water systems will drive rates higher

Rising cost of water

Average Monthly Cost of Water



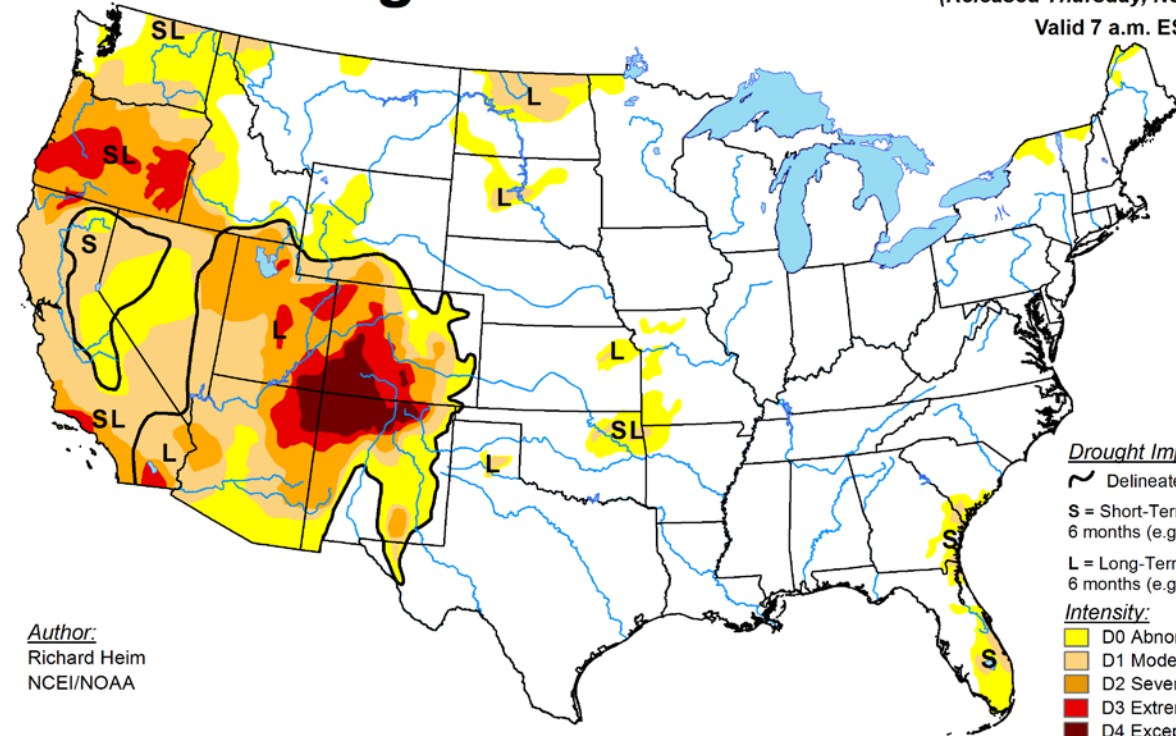
- Cost of water rising faster than the rate of inflation
- Investment in water systems will drive rates higher
- Water bills will consume a larger percentage of household budget

Repeated droughts and limited water availability



U.S. Drought Monitor

November 27, 2018
(Released Thursday, Nov. 29, 2018)
Valid 7 a.m. EST

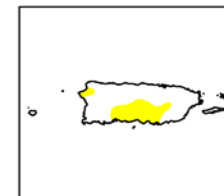
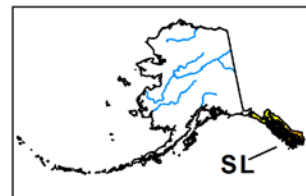


Author:
Richard Heim
NCEI/NOAA

Drought Impact Types:
~ Delineates dominant impacts
S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:
D0 Abnormally Dry
D1 Moderate Drought
D2 Severe Drought
D3 Extreme Drought
D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



<http://droughtmonitor.unl.edu/>

Evolving customer attitudes

- Concern for Puget Sound and other water resources
- Greater interest in sustainability
- Save money on utility bills
- Climate change



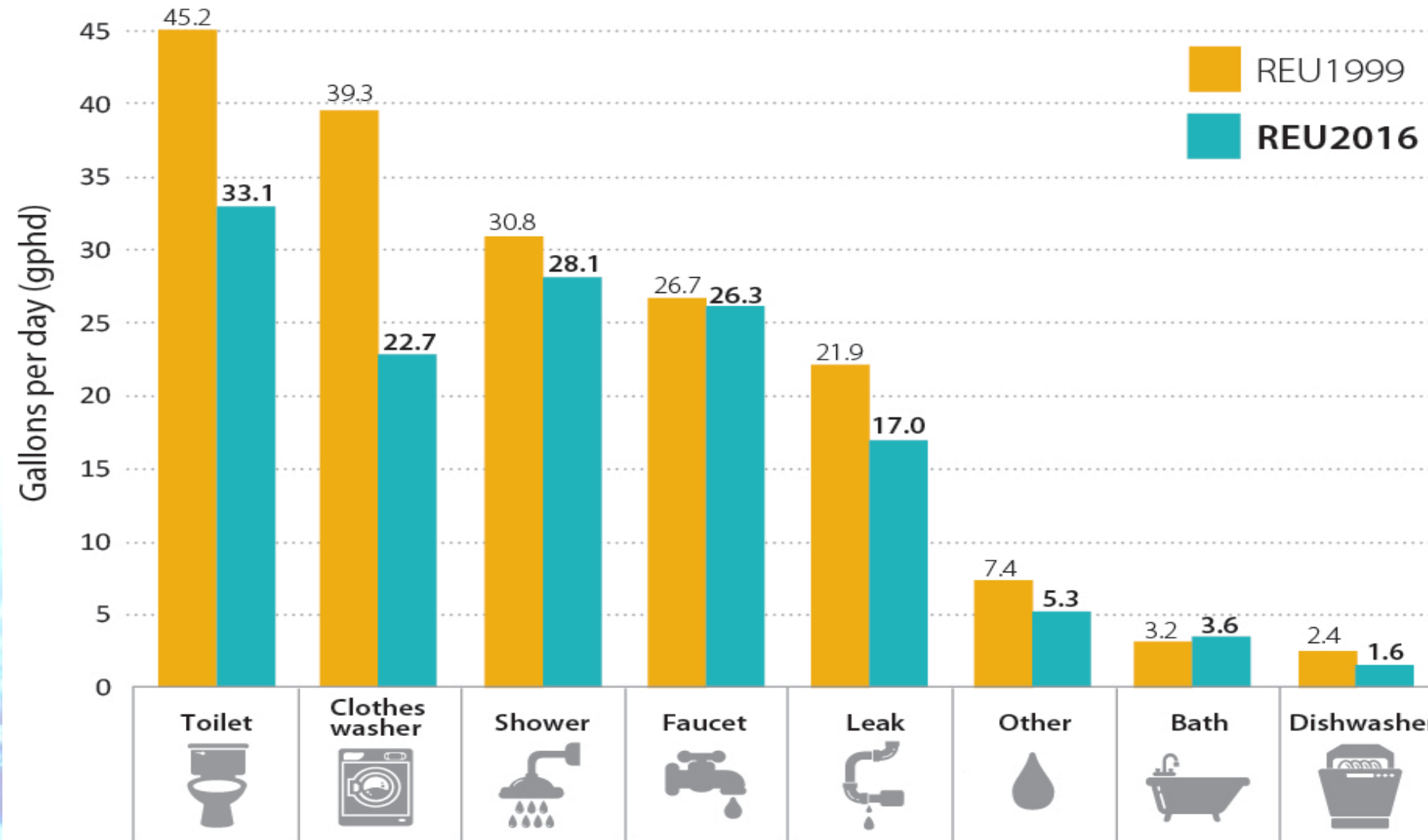
Improved water efficiency standards

Example: Toilets

- 1950s – 1980 5.0+ gpf
- 1980 – 1994 3.5 gpf
- 1994 – present 1.6 gpf
- Present – 1.28 or less gpf



Indoor water use (gallons per day per household)



US EPA WaterSense program

- Voluntary labeling program for water-using fixtures
 - Toilets | Showerheads | Faucets | Sprinklers
 - New Homes
- Must be 20% more efficient than code or standard
- Includes performance component

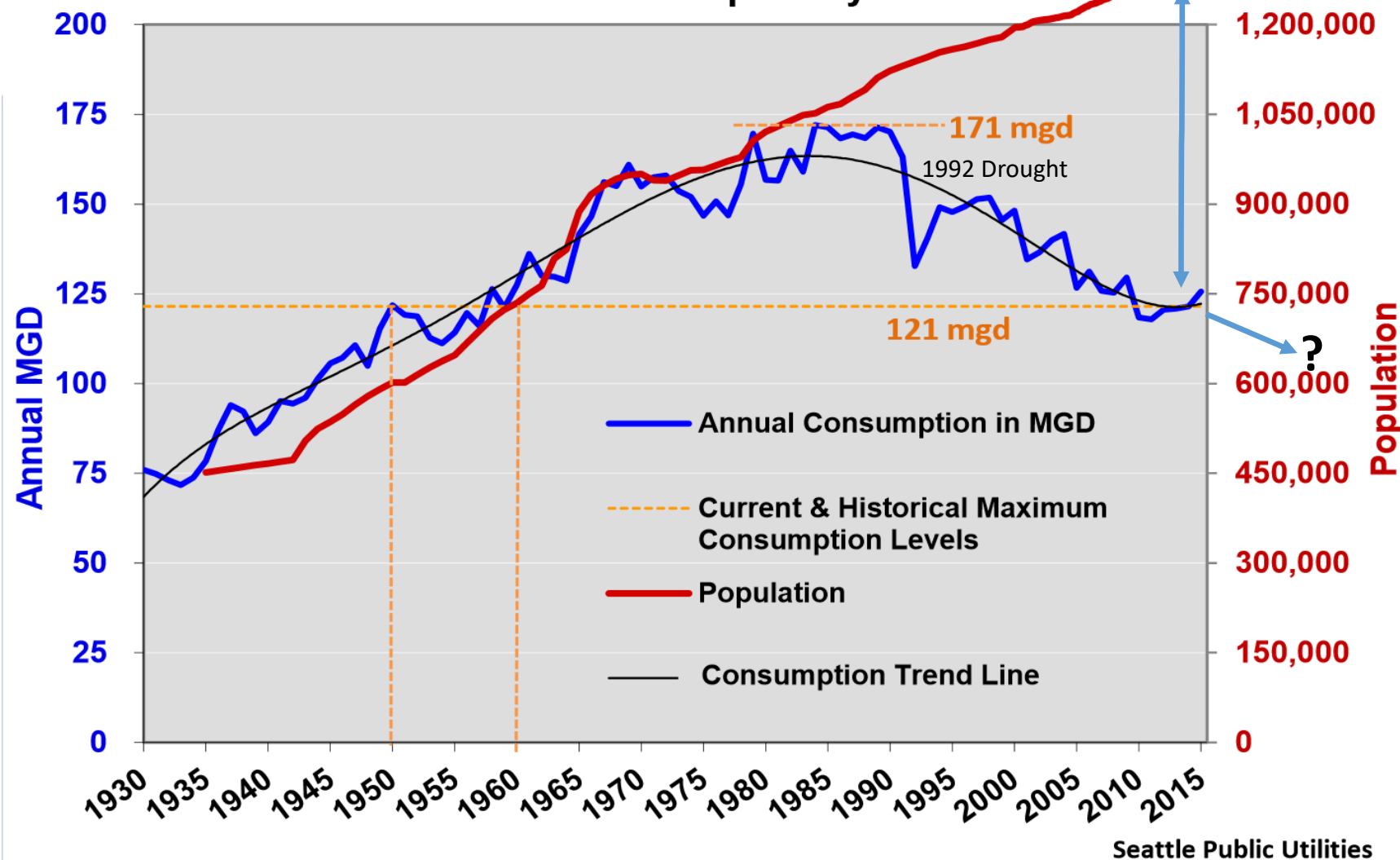


Why is municipal water demand decreasing?

Water scarcity, economics, technology, and changing values have caused water providers and end users to embrace water conservation.



Total Seattle Regional Water System Annual Demand in Millions of Gallons per Day: 1930-2015

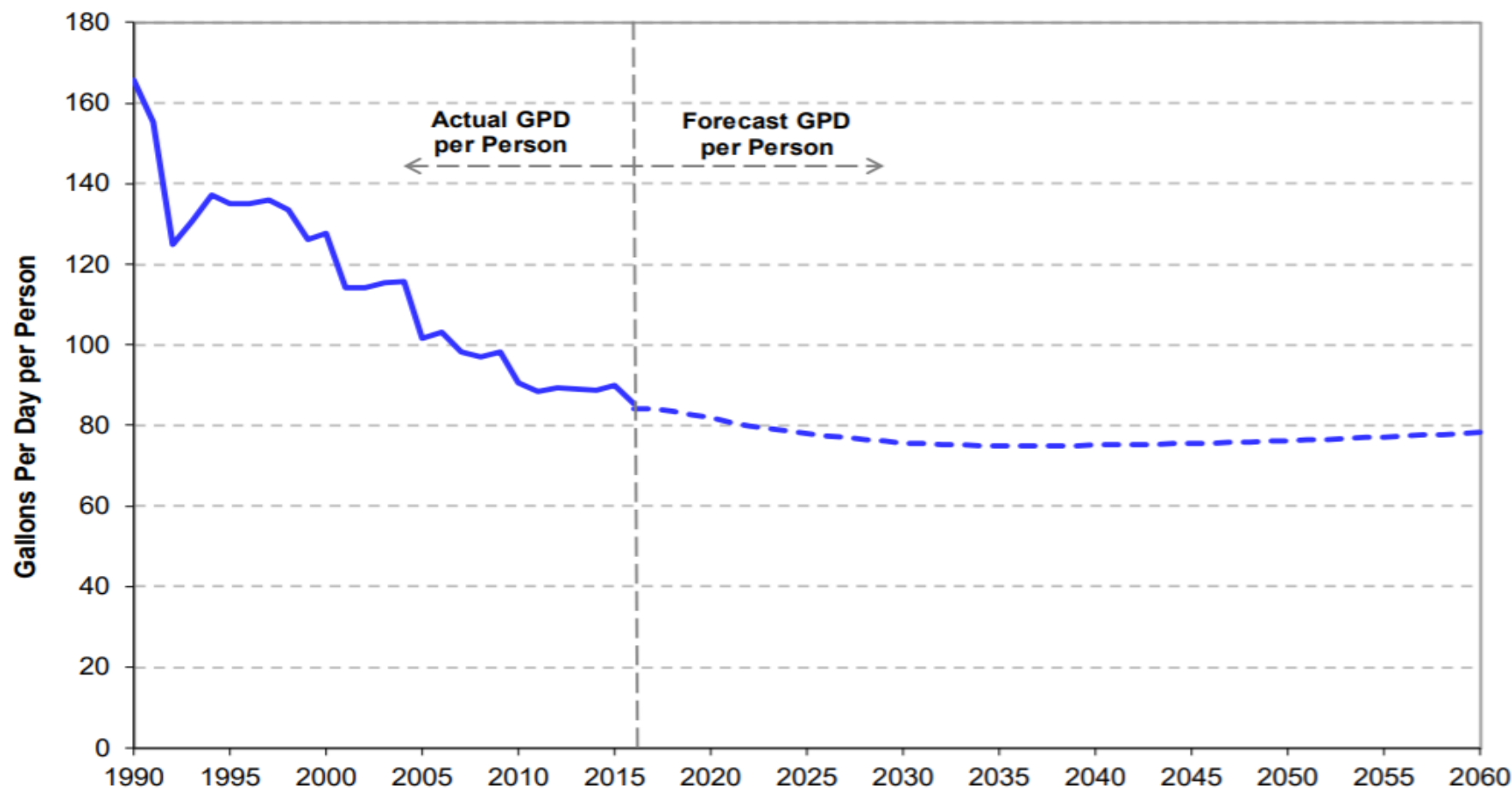


How low can we go?



How low can we go?

**Actual & Forecast Water Consumption Per Capita:
Saving Water Partnership Customers**



zHome

- Condominium in the Issaquah Highlands
- Ultra sustainable homes, zero net energy use
- Goal: municipal water use of 29 gpd/pc
 - WaterSense labeled fixtures
 - Rainwater harvesting
 - Drought resistant landscaping



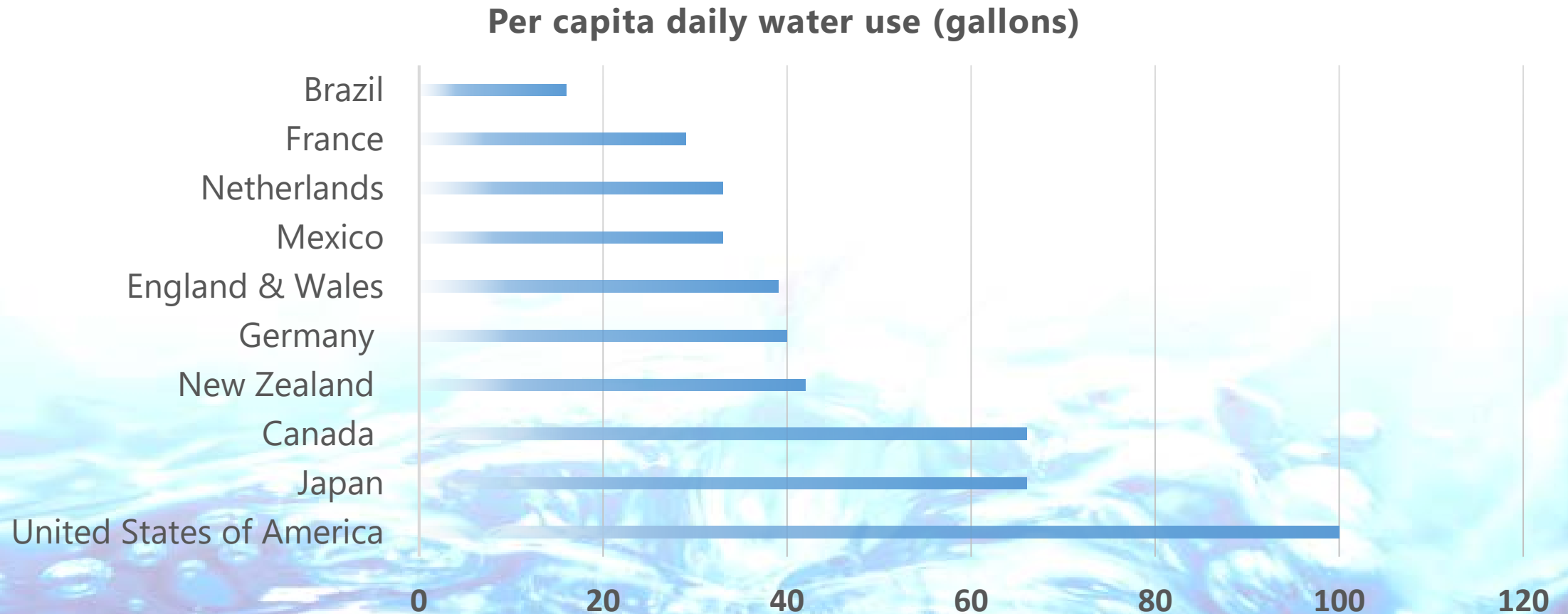
zHome municipal water use

(gallons per person per day)

- 18 gallons vs. 50-100 gallons for traditional homes
- High customer satisfaction for water fixtures and appliances



Water use in the developed world



How low can we go?

Per capita water use of 20 - 40 gallons per day is achievable

Water scarcity, economics, technology, public support, and utility conservation will continue decreasing per capita water use for many years

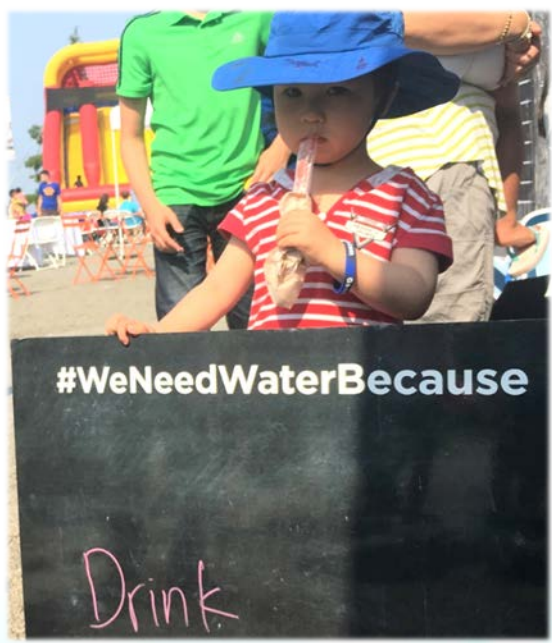


Cascade's local impact strategy

Education + action = success



Challenge people to consider the value of water



School programs

- Watershed protection, salmon recovery, science of water, water poverty
- Reached 15,000 students in 2017
- Teachers develop water-based curricula
- Perform home water audits and retrofits, community projects

Pacific Cascade MS, Water Conservation Audit Summary Completed March 2017						
			Potential Water Savings in gallons	Potential Energy Savings in kWh	Potential GHGe savings in lbs	
Students identified:						
Non-efficient clothes washer		100	591,000	98,700	60,300	
Non-efficient kitchen faucet		135	246,000	41,100	25,100	
Non-efficient bathroom faucet		553	1,760,000	294,000	180,000	
Non-efficient showerhead		308	1,040,000	174,000	106,000	
Non-efficient toilet		504	1,820,000	4,730	4,260	
Non-efficient dishwasher		119	65,300	10,900	6,660	
Toilets with leaks		92	737,000	1,920	1,720	
		Total	6,259,300	625,350	384,040	



Gardening classes and irrigation training

- Dozens of irrigation / gardening classes
- Established program at Lake Washington Institute of Technology



SUSTAINABLE LANDSCAPES I

A new course in the Sustainable Landscape Technologies series offered through the Environmental Horticulture Department at Lake Washington Institute of Technology

Fridays, 2:00-5:00PM

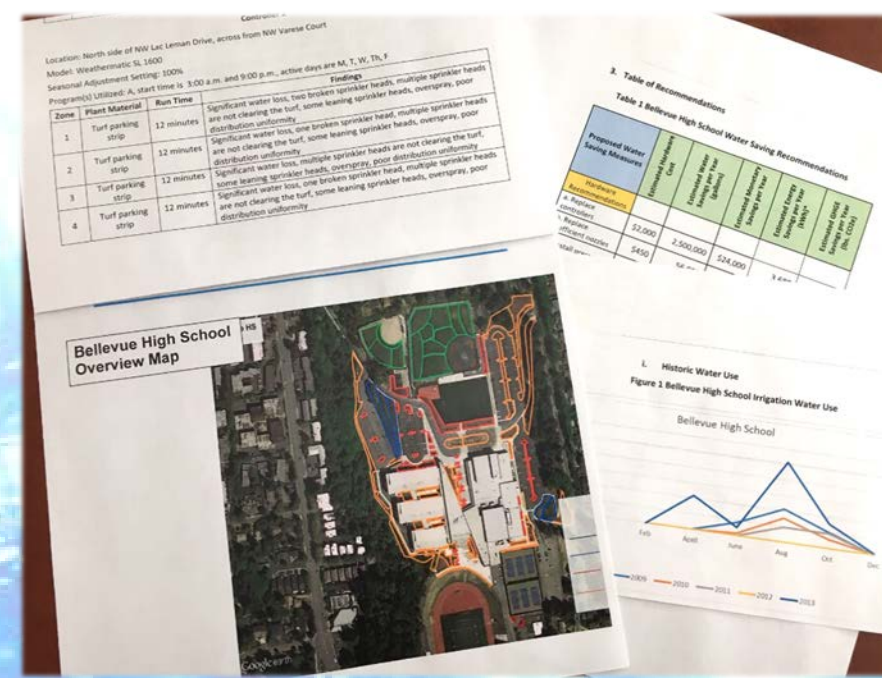
2/17/17 - 3/17/17

- Five-week course designed to be accessible to working professionals. All materials and supplies provided. **No prerequisites are required.**
- Hands-on instruction on sustainable landscaping practices & principles, including:



Bellevue School District

- Provided irrigation evaluations for 21 schools
- Analysis and recommendations
- Trained staff
- Savings of 5.3 million gallons; ~\$63,000 (2018 vs 2017)



Retrofits and upgrades

- Partner with PSE, KCHA, Hopelink, retailers and plumbers
- Rebates for toilets, commercial products (dishwashers, steamers)
- Install rainwater harvesting at schools
- Provide leak detection dye



Cascade's local impact strategy

Education + action = success

2014 – 18 generated savings of ~800,000 gpd

Equivalent to ~2% of 2017 average daily demand (37.1mgd)

Net savings of \$2.6 million

Limitations of water conservation

- Cost-effectiveness; limited “low-hanging fruit”
- Potential conflicts with revenue
- Potential water quality issues
- Staffing and administrative



Future opportunities, untapped potential

- Advanced metering infrastructure
- Submetering
- Increased efficiency standards
- Rainwater / greywater use
- Landscape irrigation
- Public education



Takeaways

Water conservation can...

- Protect quality of life for future generations
- Delay or defer expensive new water sources
- Provide increased in-stream flows
- Reduce greenhouse gas emissions
- Aid in drought mitigation
- Demonstrate stewardship of water resources

Value of Municipal Water Conservation

Thank You!

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